

Programing Assignment 1

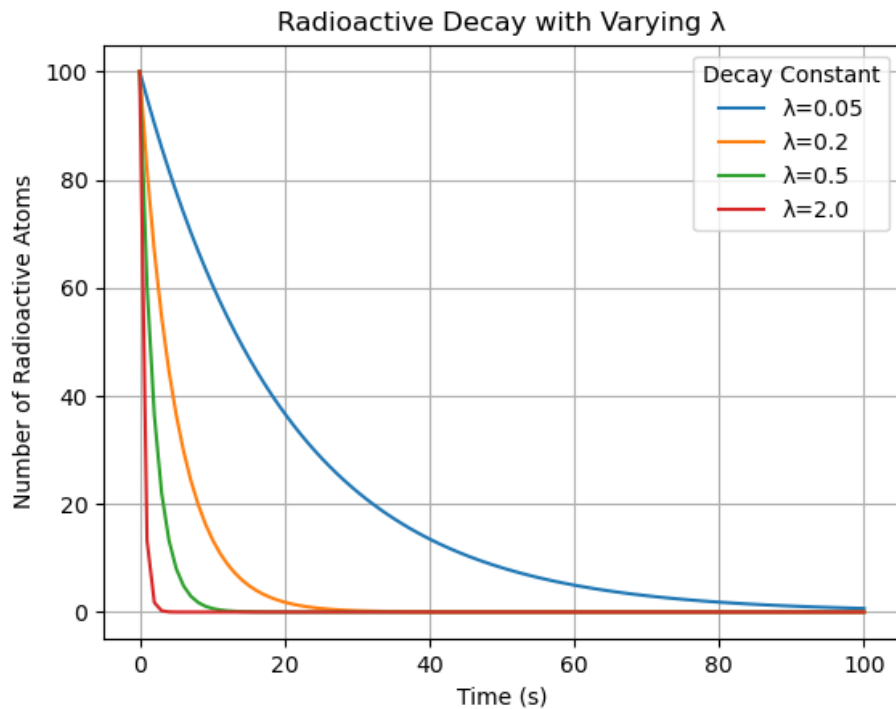
Problem 1:

Considers the equation $px^2 + qx + r = 0$ and then gives the roots, based off any given p , q , and r . Some results are given in the table below.

q, p, r	Result
1, 2, 1	There is one root -1
3, 4, 5	The roots are imaginary
2, 6, 2	There are two real roots -0.3819660112501051, - 2.618033988749895
1, 3, 2	There are two real roots -1.0, -2.0
1, -7, 10	There are two real roots 5.0, 2.0

Problem 2:

Analysis how the decay constant changes the overall equation $N(t) = N_0 e^{-\lambda t}$ this results in the graph



Problem 3:

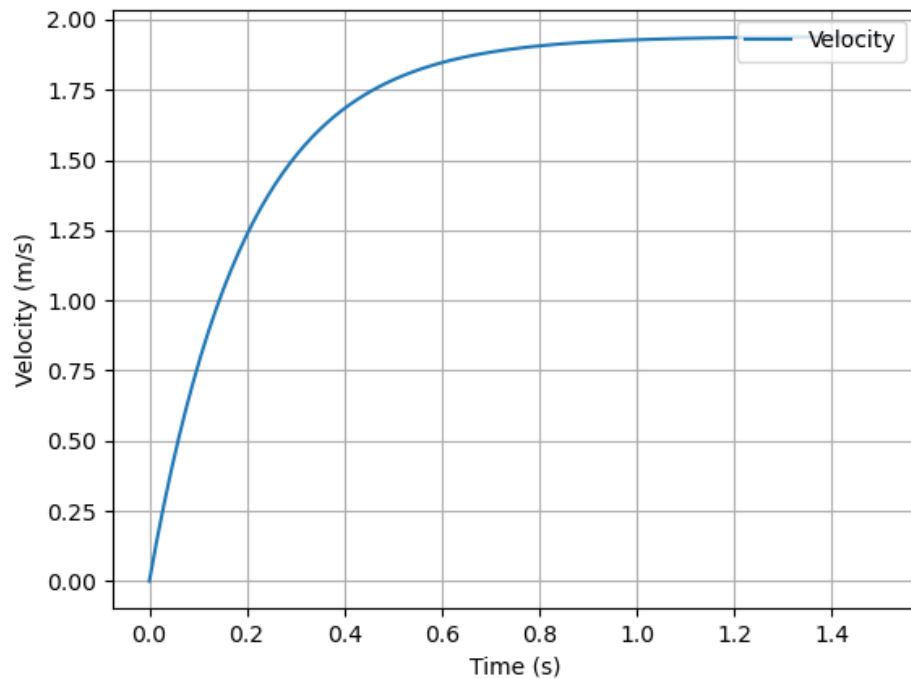
Generates a random list of 20 numbers and puts in in descending order. Then calculates the mean, median, and mode for each of the list of random numbers.

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[87, 84, 81, 78, 68, 63, 63, 61, 48, 36, 30, 29, 21, 15, 14, 13, 10, 7, 6, 1]  
Mean: 40.75  
Median: 33.0  
Mode: 63
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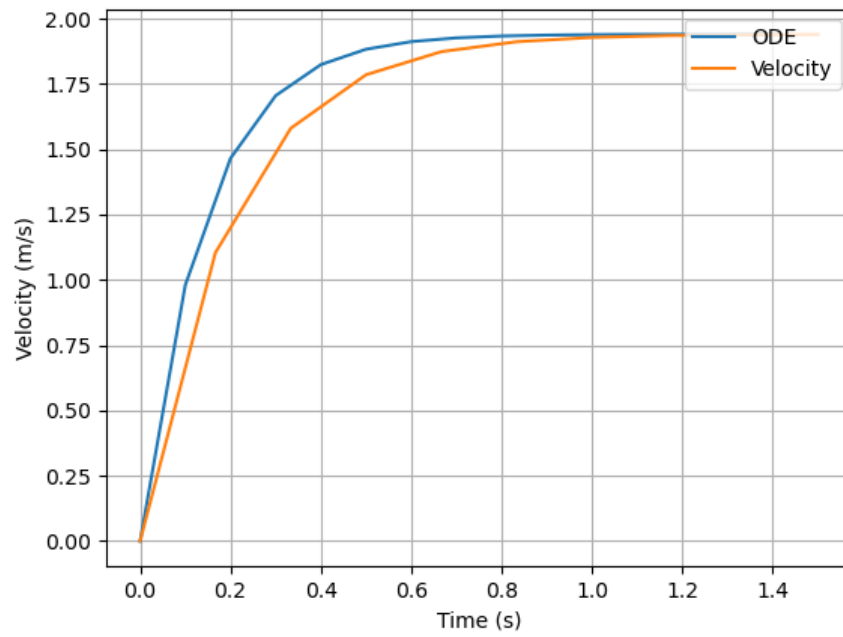
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[91, 89, 84, 82, 79, 77, 73, 64, 63, 61, 57, 53, 53, 50, 46, 44, 42, 28, 23, 15]  
Mean: 58.7  
Median: 59.0  
Mode: 53
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Problem 4:

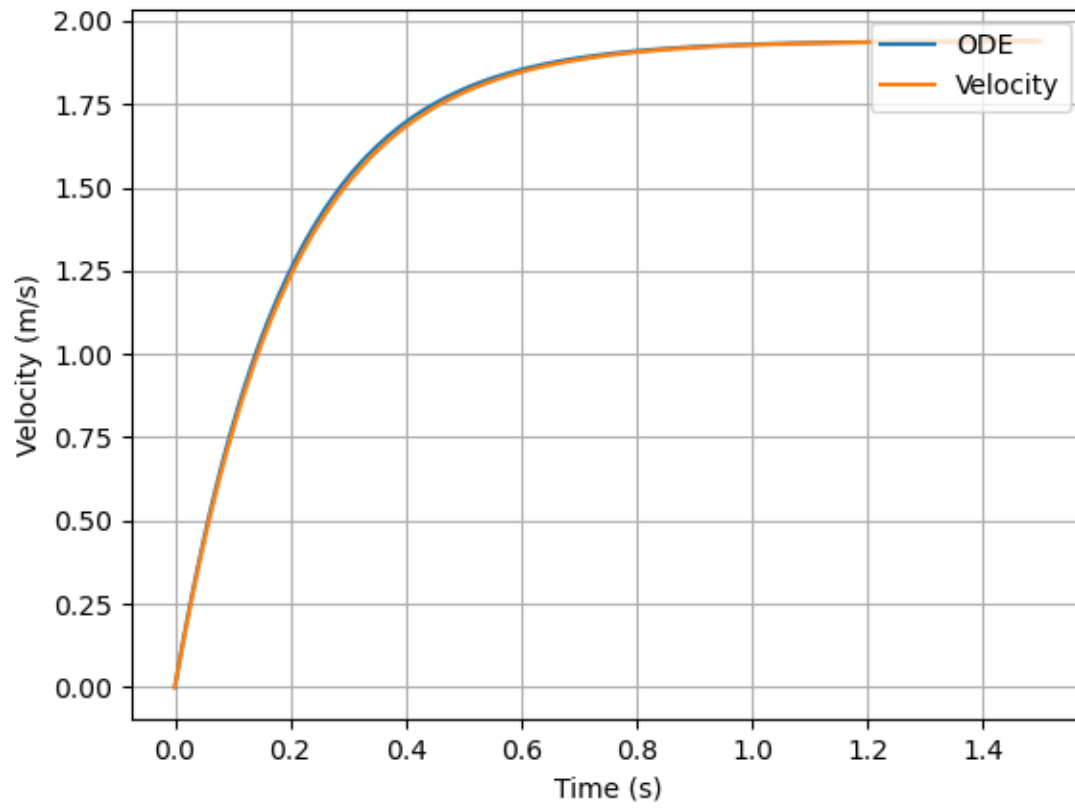
a)



b)

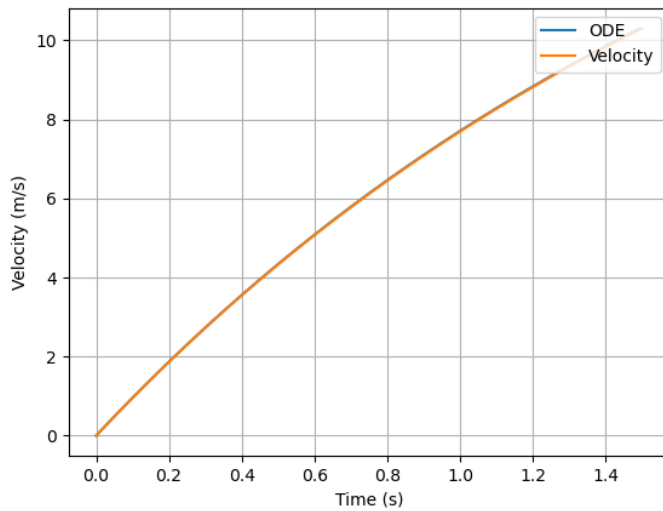
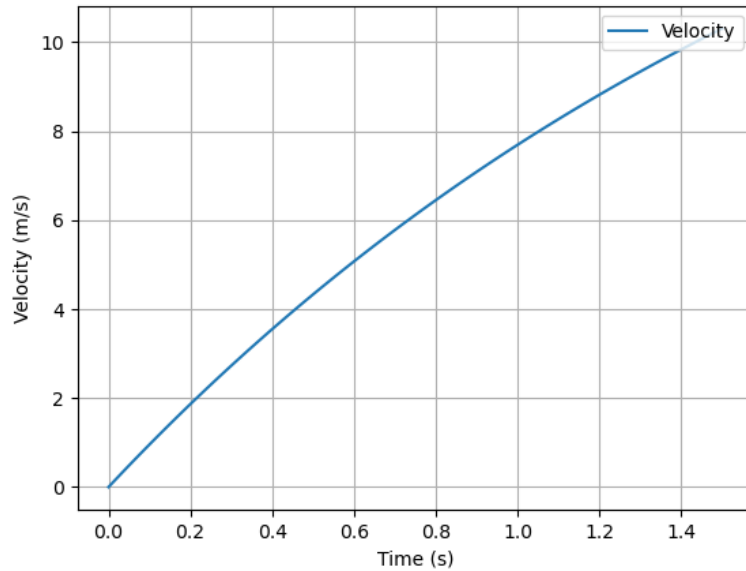


c) maximum time step that I found was 0.01



d)

When the mass changes to 98 kg the line looks to become a little bit more linear



e) Theoretically the time required to attain 99.99 percent of the terminal velocity when the mass is 98 kg is

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99.99% of the terminal velocity is: 19.4001 meters/second  
It will take: 18.3183 seconds
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